

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/12977

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ C07C211/58, C09K11/06, H05B33/14, 33/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl⁷ C07C211/58, C09K11/06, H05B33/14, 33/22

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CA (STN), REGISTRY (STN)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/14174 A1 (Idemitsu Kosan Co., Ltd.), 16 March, 2000 (16.03.00), Full text & JP 2000-309566 A & EP 1029909 A1	1-6
X	WO 98/30071 A1 (TDK Corp.), 09 July, 1998 (09.07.98), Full text & EP 891121 A1 & US 6344283 A	1-6

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"%" document member of the same patent family

Date of the actual completion of the international search

13 November, 2003 (13.11.03)

Date of mailing of the international search report

02 December, 2003 (02.12.03)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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(With respect to scope of international search for claims 1-6)

The aromatic amine derivatives use of which in the organic electroluminescent element, which has a high luminescent efficiency even at a low voltage, retains a long life and is capable of emitting blue light even at high temperatures, has been demonstrated are limited to ones in which Ar¹ and Ar² each is naphthyl or phenanthryl, Ar³ to Ar⁷ each is phenyl, naphthyl, or phenanthryl, Ar⁷ to Ar¹⁰ each is 1,4-phenylene, and L is a single bond.

When knowledges of the related art (WO 00/14174 A1 and WO 98/30071 A1) are taken into account, it can be conceived that an aromatic amine derivative wherein L is alkylene, an ether bond, or arylene is also actually usable in the organic electroluminescent element.

However, the luminescence of an organic electroluminescent element is influenced by properties of the compound used, i.e., crystallizability, stability to heat, oxygen, water, etc., and property of forming a film (layer) on the electrode, and these performances vary depending on the chemical structure of the compound used (for example, presence or absence of a functional group and substitution positions of various groups) (Comparative Examples in the description show that use of different aryl groups results in a considerable difference in luminescent performance).

It cannot hence be conceived that any compound included in the aromatic amine derivatives of claim 1 has the same luminescent properties as the aromatic amine derivatives whose use is demonstrated in the description.

Consequently, the aromatic amine derivatives of claim 1 involve ones which are not sufficiently supported by the description.

An international search report was made with respect to only the following aromatic amine derivatives, which are thought to be sufficiently supported by the description, and the organic electroluminescent elements containing these.

<Aromatic amine derivatives in which Ar¹ and Ar² each is naphthyl or phenanthryl, Ar³ to Ar⁶ each is phenyl, naphthyl, or phenanthryl, Ar⁷ to Ar¹⁰ each is 1,4-phenylene, and L is a single bond, ether bond, arylene, or alkylene.>